Recommendations

Recommendations developed to address the findings in this report include:

#1 The EPA should survey school systems nationwide and update its records to better assess the scope of potential PCB hazards in schools. The Asbestos Hazard Emergency Response Act (AHERA) should be amended to require recordkeeping by state and local educational agencies of testing for, response to, and remediation of PCB hazards in schools to be submitted to and approved by appropriate state officials, and should also require status reports from each state to the EPA both for asbestos and PCB hazards at least every ten years.

#2 Inspections and testing of schools for PCB hazards should be mandatory to ensure that the identification of such hazards is not left to chance. This could be accomplished through an amendment to AHERA to extend and update requirements that are already in place for asbestos in schools to PCBs. In the meantime and at a minimum, the EPA should update its testing guidance to encourage inspections of all schools built or retrofitted between 1950 and 1979, and improve its efforts to communicate testing guidance to states, local education agencies, and schools with potential PCB hazards.

#3 The EPA should immediately develop guidance regarding the means by which parents, teachers, and employees should be notified of potential PCB hazards. In addition, AHERA should be amended to make such notification to parents, teachers, and employees mandatory, as is the case for asbestos, and to require states to notify the EPA whenever a PCB hazard that requires remediation is identified, prior to beginning remediation efforts.

#4 The EPA should immediately develop and implement guidance to enhance consistency in recordkeeping, sharing of best practices and other information, outreach to states and school districts, and enforcement activities related to PCB hazards in schools across all EPA regions. EPA regional offices should increase their outreach to states and local education agencies to make them aware of available EPA's PCB regulations, guidance and resources.

#5 The EPA should update its current guidance on PCB hazards in schools to incorporate lessons learned from previous remediation projects and best available science. The EPA should quickly update its TSCA regulations to prohibit the continued use of PCB-containing fluorescent light ballast, and require – not just recommend – the removal of all PCB-containing ballast from schools. Schools should also be required to have detailed plans before starting a PCB remediation project. This could be accomplished by amending AHERA to require schools to create, submit, and maintain a management plan for PCB hazards, including testing for PCB hazards post-remediation.

#6 Congress needs to immediately authorize and appropriate money for the testing for, response to, and remediation of PCB hazards in schools.

Introduction

Polychlorinated biphenyls (PCBs)[2] are a tasteless and odorless class of man-made industrial chemicals manufactured in the United States from the late 1920s until 1979. PCBs can withstand high temperatures and are not very flammable, which made them useful for a variety of commercial processes and products. Uses included electrical equipment such as transformers, oils for hydraulic systems and motors, solvents for caulk, certain oil-based paints, floor finishes, plastics, and internal components in fluorescent lights known as ballast (the device that regulates the amount of energy flowing to the lighting fixture). In the Toxic Substances Control Act (TSCA) of 1976 (for which PCB regulations came into effect in 1979),[3] Congress banned most of the manufacturing, processing, or distribution of PCBs. The law also provided EPA with the authority to regulate the disposal and remaining authorized uses of PCBs through reporting, record-keeping, testing, and other restrictions of their use.[4] The EPA is currently in the process of updating its PCB regulations under TSCA.[5]

PCBs are known to cause a variety of adverse health issues, including cancer. The EPA has listed PCBs as a "probable human carcinogen"[6] and the World Health Organization (WHO) International Agency for Research on Cancer (IARC) has listed PCBs as a Group 1 Carcinogen, meaning that the material is "carcinogenic to humans."[7] Studies have linked PCB exposure to increased risk of melanoma, brain cancer, and stomach, intestinal, and thyroid cancers.[8] High-level exposure may cause immune system suppression, elevated risk of cardiovascular disease, hypertension, and diabetes, hormonal effects, and asthma. In addition, PCBs have been shown to cause negative effects on birth weight, infant motor skills, and cognitive growth problems.[9]

Schools built or retrofitted between 1950 and 1979 are likely to contain PCB hazards, most commonly found in caulk and fluorescent light ballast, but also in other building materials such as adhesives, oil-based paint, and floor finish. A recent Harvard School of Public Health study[10] estimates the number of schools to have PCBs in building caulk to be between 12,960 and 25,920. In 2010, the average number of students per school was roughly 550 students according to National Center for Education Statistics[11], adding up to the potential of 7 - 14 million elementary or secondary school students that could be exposed to PCBs through caulk. This accounts for 15-30% of the total schools in the United States and up to 30% of the school-aged population. In addition to elementary or secondary schools, there are likely numerous colleges and universities with PCB-containing caulk. Additionally, the total number of impacted schools and students would also be expected to increase with an estimate that included potential PCB exposures from fluorescent light ballast and other building materials.

The EPA[12] has identified some of the uses of and potential problems surrounding PCBs in schools:

- Since most new manufacturing of PCBs has been banned since EPA finalized regulations under TSCA in 1979, any PCB-containing building materials or fluorescent light ballast in schools must be at least 37 years old.
- Fluorescent light ballast that contains PCBs is likely past its usable lifespan, increasing the chance of rupture and subsequent PCB exposure for occupants in a building. Any rupture of PCB-containing ballast puts those exposed to the material at risk, and subsequent cleanup costs are significant. The EPA recommends that any ballast containing PCBs be removed, but current regulations do not require removal unless the PCB-containing liquid is leaking out of the ballast.
- Caulk applied between 1950 and 1979 may contain PCBs. PCB-containing caulk can emit PCBs, contaminating the surrounding air and adjacent building materials. Under EPA's current regulations,

caulk containing PCBs at concentrations greater than 50 ppm is not authorized for use, but EPA does not enforce this regulation at schools, only requiring it to be removed after an identified problem or exposure.

- Even when PCB-containing materials such as caulk are removed, materials that were adjacent to the contaminated materials may have become contaminated and still emit PCBs. For example, the wooden framing around a window where PCB-containing caulk was located can become contaminated and release PCBs even after the caulk has been removed.

- For materials with low levels of PCBs, covering a PCB-containing material with another material, a process known as encapsulation, may be an appropriate containment technique that can be chosen on a case-by-case basis. However, choosing the correct material and application technique is essential. Laboratory tests published by the EPA in 2015 ranked various coatings for their ability to prevent PCB migration; however, none of coatings tested were completely effective in ensuring no level of PCB exposure.[13]

- To reduce risk of exposure, the EPA recommends indoor air exposure levels for schools that are "likely to be without an appreciable risk of harmful effects during a lifetime"[14] as a means "to guide thoughtful evaluation of indoor air quality in schools."

EPA is evaluating its current PCB regulations and published an Advanced Notice of Proposed Rulemaking in 2010[15]. This announced the EPA's intent to update the authorized uses of PCBs, including the possibility of phase-outs for certain currently authorized uses of PCBs and a change to the level at which products with PCBs are subject to federal regulation.[16]

According to data provided to Senator Markey's office by the EPA (Attachment 1), EPA has been made aware of 286 cases of potential PCB hazards in 20 states affecting thousands of school buildings in the past ten years. The cases ranged from the remediation of a single leaking PCB-containing fluorescent light ballast to the remediation of PCB-containing materials across some of the largest school districts in the country. This report discusses and illustrates the tremendous variation in how each case was discovered and responded to by the State, school district, and EPA. For example, a school building in Lexington, Massachusetts was demolished and rebuilt because the school could not successfully remediate the PCBs even after following the EPA guidance. All of the fluorescent light ballasts from 739 New York City public schools were required to be replaced after a lawsuit demonstrated insufficient action from the school district. A lawsuit in Malibu, California has pitted parents against a school district that spent more money on lawyers and consultants than it would reportedly have cost to remediate the entire school. In September 2016, a judge ruled in favor of the parents and required the district to replace all caulk and surrounding windows and door systems by 2019 to continue using the affected schools.

The need for investment in school infrastructure is not a new concern. A February, 1995 Government Accountability Office (GAO) report on school facilities' conditions[17] found that our nation's schools needed $112 billion ($178 billion in 2016 dollars) to repair or upgrade facilities. A follow-on GAO report[18] found that although there are schools all over the country in need of repair, the largest percentage of schools needing repairs were located in central cities, which generally served a majority-minority population. Additionally, only nine states reported to GAO that at least 50% of their schools had satisfactory environmental conditions. The remaining states reported that less than 50% of their schools had satisfactory environmental conditions. A 2000 report by the National Education Association estimated the cost of fixing and modernizing our nation's schools at $332 billion.[19]

The 2013 Report Card for America's Infrastructure by the American Society of Civil Engineers gives America's

schools a grade of "D+" and notes that more than half of them were built to educate the Baby Boomer generation. In 2012, approximately $10 billion was spent on school construction, which is half the amount spent prior to the recession.[20] Recent calculations show that America's schools are facing $271 billion in deferred maintenance now, and estimated costs to address repairs and modernization will require $542 billion over the next ten years.[21] It is unclear if current estimates would include potential PCB-mitigation projects. An estimate of $2 million in PCB remediation costs per school[22] for the estimated 12,960 to 25,920 schools that include PCB-containing caulk yields a potential total cost of $25.9 billion to $51.8 billion, nationally.

Methodology

In order to gauge the extent to which public information is available on PCBs in schools, Senator Markey's staff conducted an internet search of each state's government websites (including the District of Columbia) on relevant topics. While the survey was not exhaustive, staff would expect these searches to be similar to that which a teacher, school administrator, parent or guardian may do to ascertain information on PCBs. An internet search was performed for each topic below for each state using a general internet search engine and also within the educational, environmental, and health agency website(s) of each state:

- General information on PCBs in schools, or information applicable to all state agencies.
- School PCB testing guidance, or guidance applicable to all state agencies.
- School PCB reporting guidance, guidance applicable to all state agencies, or reporting guidance for citizens on a potential PCB-exposure event.
- PCB disposal guidance for schools, or information applicable to all state agencies.
- PCBs in fluorescent light ballast.
- PCBs in caulk.

See Table 2 on *page 12* for a complete list of what states had information in each category and Appendix A for the list of web addresses where information was found.

In addition, the EPA provided Senator Markey's office with a list (see Table 1 on *page 11* for a summary of the 286 cases of potential PCB hazards in schools in 20 states and Attachment 1 for the complete document) of cases involving schools, including colleges and universities, which worked with the EPA regarding potential PCB hazards in the past ten years. The list of potential cases ranged from a PCB spill in a single room in a single school building to district-wide remediation actions for some of the largest school districts in the United States. Senator Markey's staff sought further information, including press reports and discussions with individuals who worked on some of these incidents, when available. Details not footnoted in the report are from the information provided by the EPA, which is provided as an attachment to this report.